

5.) A carpenter makes bookcases in two sizes: large and small. It takes 6 hours to make a large bookcase and 2 hours to make a small bookcase.

Constraints: The carpenter only has 24 hours to work each week and must make at least two of each type of bookcase per week.

Profit: A large bookcase makes \$50. A small bookcase makes \$20.

a.) Write a system of inequalities to represent the **constraints**.

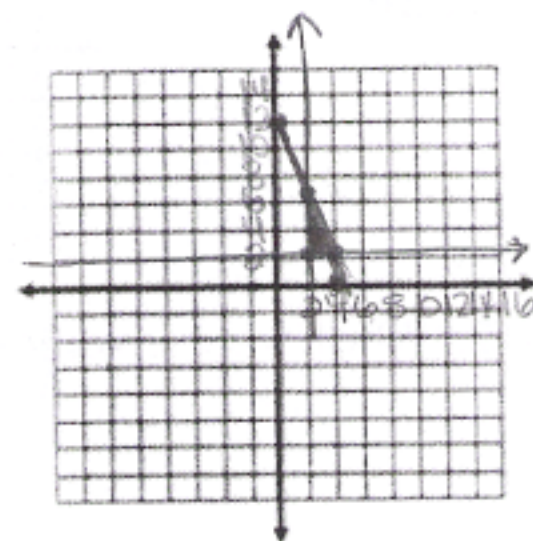
$$\begin{aligned} x &\geq 2 & y &\geq 2 \\ 6x + 2y &\leq 24 \end{aligned}$$

b.) Graph the **feasible region**.

$$\text{vertices: } (2, 6), (2, 2), (3.3, 2)$$

c.) Write an **objective function** for the profit.

$$P = 50x + 20y$$



d.) What is the maximum profit possible?

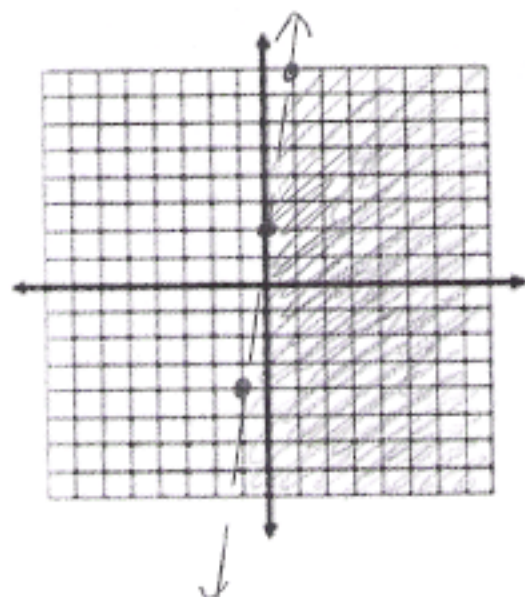
$$P = 50(2) + 20(6) = 100 + 120 = 220 \text{ max}$$

$$P = 50(2) + 20(2) = 140$$

$$P = 50(3.3) + 20(2) = 166.67 + 40 = 207$$

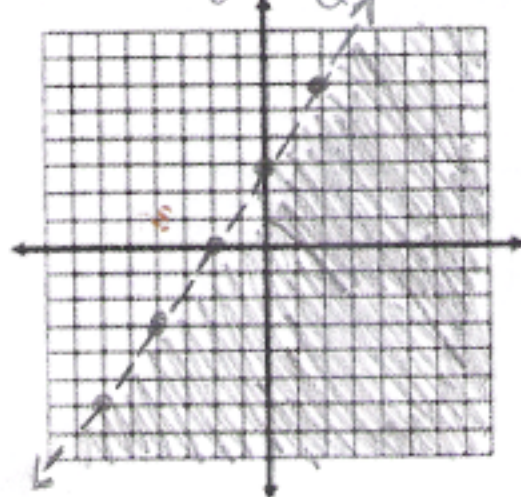
6.) Graph each inequality or system of inequalities.

a.)  $y < 6x + 2$



b.)  $6x - 4y > -12$

$$\begin{aligned} 6x + 12 &> 4y \\ y &< \frac{3}{2}x + 3 \end{aligned}$$



c.)  $\begin{cases} y \geq 2x - 1 \\ x > 1 \\ y < 5 \end{cases}$

